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(54) IMPROVEMENTS IN OR RELATING TO ROTARY OFFSET PRINTING MACHINES

(71) We, VEB POLYGRAPH LEIPZIG KOMBINATE FUR POLYGRAPHISCHE MASCHINEN UND AUSRUSTUNGEN, of 59 Zweinaundorfer Strasse, 705 Leipzig, German Democratic Republic, a corporation organised under the laws of the German Democratic Republic, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a rotary offset printing machine provided with a combined inking and moistening device.

Roller moisten devices which moisten the plate cylinder through rollers, which are components of an ink roller arrangement and thus already carry an ink coating, are known.

Printing machines basically have arrangements for switching-off of the printing and the inking of the printing master. The switching-off of the printing, which can take place independently of the switching-off of the inking, is effected as a rule by enlargement of the spacing between a blanket cylinder and an impression cylinder, and does not affect the arrangement of the ink and moistening rollers.

For the switching-off of the inking of the plate cylinder, it is known to space the inking rollers—normally contacting the plate cylinder—from the plate cylinder so that they no longer contact the plate cylinder. At the same time, the supply of ink from the ink well to the ink roller train must be interrupted, for example by pivoting a grooved roller away from a ductor roller. It is known on switching off of the inking to move one of the ink rollers of the ink roller train away from a roller preceding or following that one ink roller to prevent the ink layer thickness gradient in the ink roller train from evening out. Together with the switching off of the inking, the moistening is interrupted by moving a connector roller, which is located between the inking mechanism and the moistening ductor roller, away from the latter.

Consequently, two operational states are possible in known ink and moistening roller trains, that is to say 'inking on' and 'inking off,' with the different states being realised by a radially movable arrangement of the inking rollers and the grooved roller, for example, one or more intermediate rollers in the inking roller train and a connecting roller between the ink rollers and a moistening means ductor roller. The application of moistening means and the application of ink are combined on the one hand by coupling the movement of the grooved roller against the ink ductor roller with the movement of the connecting roller against the moistening means ductor roller and the ink rollers, and on the other hand by employing the ink-coated rollers for supply of moistening means to the plate cylinder. Due to the arrangement of the roller trains and to the requirements of offset printing, it is impossible to ink the plate cylinder without simultaneous moistening or to moisten it without simultaneous inking.

In these known combined ink roller and moistening roller trains, it has proved disadvantageous that it is not possible to moisten the plate cylinder without simultaneous inking. When the printing machine is started up after a short standstill and the printing and the ink supply are again switched on, then the plate cylinder and the ink rollers are initially dry due to evaporation of the moistening fluid during the standstill of the machine, so that the plate cylinder may initially take up ink at places which should really be moistened and therefore repel the ink. Until the requisite ink-water equilibrium is again attained on the plate cylinder, a number of prints must first be produced as misprints to be regarded as waste paper and to be sorted out. Similar conditions arise during idle running of the printing machine, which may for example be switched in automatically, since the printing as well as the ink supply to the plate

cylinder must also be switched off automatically.

According to the present invention, there is now provided a rotary offset printing machine comprising a plate cylinder, at least one first applicator roller operatively coupled by moistening roller means to moistening supply means, at least one second applicator roller coupled by inking roller means to ink supply means, control means to selectably apply the or each first applicator roller against the plate cylinder independently of the position of the or each second applicator roller relative to the plate cylinder, and a separate connecting roller having an axis displaceable between a first position, in which the connecting roller provides a fluid transmitting connection between the moistening roller means and the inking roller means, and a second position, in which the fluid transmitting connection is interrupted.

In a preferred embodiment of the rotary offset printing machine, there are provided further control means to selectably apply the or each second application roller against the plate cylinder, the arrangement being such that the or each second applicator roller is so applicable only together with or after such application of the or each first applicator roller. Additionally or alternatively, the axis of the connecting roller may be displaceable into the first position when and only when the or each first applicator roller is applied against the plate cylinder.

Embodiments of the present invention will now be more particularly described by way of example with reference to the accompanying drawings, in which:—

Fig. 1 is a schematic side elevation of the roller trains of a rotary offset printing machine embodying the present invention;

Fig. 2 is a detail of part of the roller trains shown in Fig. 1; and

Fig. 3 is a schematic circuit diagram of means in the machine to control the roller trains.

Referring now to Fig. 1 of the drawings, there is shown a roller arrangement which differs from a conventional roller arrangement only in respect of the mounting of a connecting roller 15*a* and the manner of control of the engaging and disengaging movement of applicator roller pairs 7*a* and 13*a*. The means for the conventional engaging and disengaging of further rollers form no part of the present invention and are therefore neither described nor illustrated.

An ink well 1 is closed off by a ductor roller 2, against which a grooved roller 3 is applicable by means (not shown) for the take-up of ink. An ink roller 4 constantly touches the grooved roller 3 and transfers the ink to a distributor roller 5. Two ink distributor rollers 6 pick up the ink from the roller 5, the right hand one of the two ink distributor rollers 6 transferring the ink, via a further ink roller 4 and a further ink distributor roller 6, to the ink applicator roller pair 7*a*, which is mounted in conventional manner to be applicable against a plate cylinder 14 (as shown in Fig. 1) or to be pivotable therefrom into position 7*b* (shown in dot-dashed lines in Fig. 1).

A moistening ductor roller 9, against which a metering roller 10 is applied, dips into a moistening fluid container 8. From the moistening ductor roller 9, the moistening fluid is picked up by an intermediate roller 11 and passed by a distributor roller 12 to the applicator roller pair 13*a*, which are mounted by means more closely described with reference to Fig. 2 and which are similarly applicable against the plate cylinder 14 (as shown in Figs. 1 and 2) or pivotable away therefrom into position 13*b* (as shown in dot-dashed lines in Figs. 1 and 2). In known roller arrangements, the applicator roller pairs 13*a* and 7*a* are always moved simultaneously, often by a single actuating means, against the plate cylinder 14 or away therefrom; in the roller arrangement of the printing machine embodying the present invention, the applicator roller pair 13*a*, leading in the indicated direction of rotation of the plate cylinder 14, is settable against the plate cylinder 14 independently of the second applicator roller pair 7*a*. The second applicator roller pair 7*a* by contrast can be set against the plate cylinder 14 only together with or after the first applicator roller pair 13*a*, as will be more closely explained with reference to Fig. 3. Suitable known actuating means (not shown) are provided to set the intermediate roller 11 against the moistening ductor roller 9 or away from this; these actuating means may be so coupled with the means for the engaging or disengaging of the first applicator roller pair 13*a* that the rollers 11 and 13*a* are simultaneously set against their associated rollers 9 and 14 or moved away therefrom.

It is easily to be deduced from the foregoing that the right hand part of the roller arrangement from the ink ductor roller 2 to the second applicator roller pair 7*a* represents a pure inking device and the left hand part of the roller arrangement from the moistening ductor roller 9 to the first applicator roller pair 13*a* a pure moistening device, and that the plate cylinder 14 is only moistened when the first applicator roller pair 13*a* is set against the cylinder 14 and the second applicator roller pair 7*a* away from the cylinder 14. Such a separate moistening, and an inking effected after the engagement of the second applicator roller pair 7*a*, would not as a rule lead to a satis-

factory printing result. A connecting roller 15*a* in a connecting roller bearing 16 (Fig. 2), the two spigots of which are urged by restoring springs 17 against the push rod of a setting element 18 actuable, for example, electro-magnetically, is therefore arranged between the left hand one of the ink distributor rollers 6 and the distributor roller 12.

When the setting element 18 is switched on, its push-rod presses the connecting roller 15*a* to the right against the force of the restoring spring 17, so that the connecting roller 15*a*, in the position shown in Figs. 1 and 2, touches the ink distributor roller 6 as well as the distributor roller 12. As a result, some of the printing ink passes by way of the moistening device and the first applicator roller pair 13*a*, thus by way of the left hand branch of the roller arrangement, to the plate cylinder 14, as is usual in the case of combined inking and moistening devices.

When the setting element 18 is switched off, then the restoring spring 17 urges the connecting roller 15*a* into position 15*b* (shown in dot-dashed lines in Figs. 1 and 2) in which the roller 15*a* is spaced from the rollers 6 and 12 by gaps 5 thereby to interrupt the ink supply to the moistening device as well as the moistening fluid supply to the inking device. When the first applicator roller pair 13*a*, in the position 15*b* of the connecting roller 15*a*, is set against the plate cylinder 14, for example during idle running of the machine, then the cylinder 14 is moistened so that the aforementioned defects associated with conventional combined inking and moistening devices are substantially avoided.

The application of the first applicator roller pair 13*a* can be effected in any desired known manner. In Fig. 2, the applicator rollers 13*a* are individually pivotable about the axis of the distributor roller 12 and are individually set by a respective setting element 21 against the plate cylinder 14 in a manner similar to that explained with reference to the connecting roller 15*a*. The second applicator roller pair 7*a* is similarly mounted and applied in the same manner by two setting elements 22, which are illustrated schematically in Fig. 3.

Fig. 3 shows schematically a diagram of the circuit for the control of the roller application, which excludes operator errors and automatically switches over to moistening on switching off the printing by control equipment in the printing machine. The schematically illustrated setting element 18 corresponds in construction and function to the setting element 18 described with reference to Fig. 2; two further setting elements 21 in the switched-on state set the first applicator roller pair 13*a*, and two third setting elements 22 the second applicator roller pair 7*a*, against the plate cylinder 14.

On switching on, a voltage is applied by a MOISTENING switch 19 to the setting elements 21, which set the first applicator roller pair 13 against the plate cylinder and prepares for switching on of the inking by applicator of the voltage to an INKING switch 20. On switching on the switch 20, with the switch 19 and a selector switch 24 both switched on, the setting element 18 for the application of the connecting roller 15*a* and the setting elements 22 for the application of the applicator roller pair 7*a* are switched on; printing is done normally with moistening and inking, as illustrated in Fig. 1, the roller pairs 7*a* and 13*a* being applied against the cylinder 14. When the printing is switched off and the machine switched to idle running by known control equipment, these switching processes cause a release contact 23 to be opened, thus causing the setting elements 19 and 22 to be switched off and the connecting roller 15*a* and the second applicator roller pair 7*a* to be moved into their positions 15*b* and 7*b*, respectively, so that the plate cylinder is now only moistened. On the normal machine run being switched on again, the release contact 23 is simultaneously closed so that inking is again done normally. If, in exceptional cases, moistening and inking is to be separately effected by the applicator roller pairs, the selector switch 24 can be opened to prevent the actuation of the setting element 18. To achieve satisfactory moistening by a bare roller moistening device, the rollers must carry a thin ink coating. By brief pressure on a key 25, the setting element 18 is actuated and the connecting roller 15*a* is briefly engaged, so that the moistening rollers receive the thin ink coating required for the moistening fluid transfer. Subsequently, the selector switch 24 is opened when moistening is to be effected only by the first applicator roller pair 13*a*.

The preceding description is only one example of a roller arrangement within the scope of the invention as defined in the appended claims, the number and arrangement of rollers being variable within such scope.

WHAT WE CLAIM IS:—

1. A rotary offset printing machine comprising a plate cylinder, at least one first applicator roller operatively coupled by coupled by inking roller means to ink supply means, at least one second applicator roller couped by inking roller means to ink supply means, control means to selectably apply the or each first applicator roller against the plate cylinder independently of the position of the or each second applicator roller relative to the plate cylinder, and a separate connecting roller having an axis displace-

able between a first position, in which the connecting roller provides a fluid transmitting connection between the moistening roller means and the inking roller means, and a second position, in which the fluid transmitting connection is interrupted.

2. A rotary offset printing machine as claimed in claim 1, comprising further control means to selectably apply the or each second applicator roller against the plate cylinder, the arrangement being such that the or each second applicator roller is so applicable only together with or after such application of the or each first applicator roller.

3. A rotary offset printing machine as claimed in either claim 1 or claim 2, wherein the axis of the connecting roller is displaceable into the first position when and only when the or each first applicator roller is applied against the plate cylinder.

4. A rotary offset printing machine substantially as hereinbefore described with reference to and as illustrated by Fig. 1 of the accompanying drawings.

5. A rotary offset printing machine substantially as hereinbefore described with reference to and as illustrated by Fig. 2 of the accompanying drawings.

6. A rotary offset printing machine as claimed in any one of the preceding claims and substantially as hereinbefore described with reference to and as illsutrated by Fig. 3 of the accompanying drawings.

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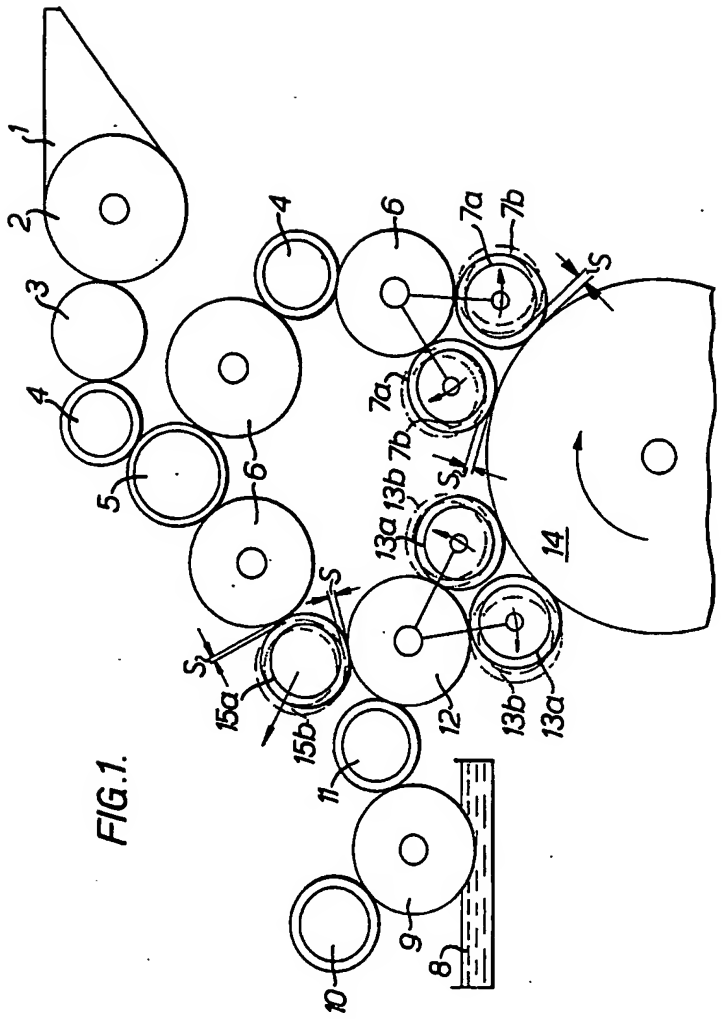

FIG.1.

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Sheet 2

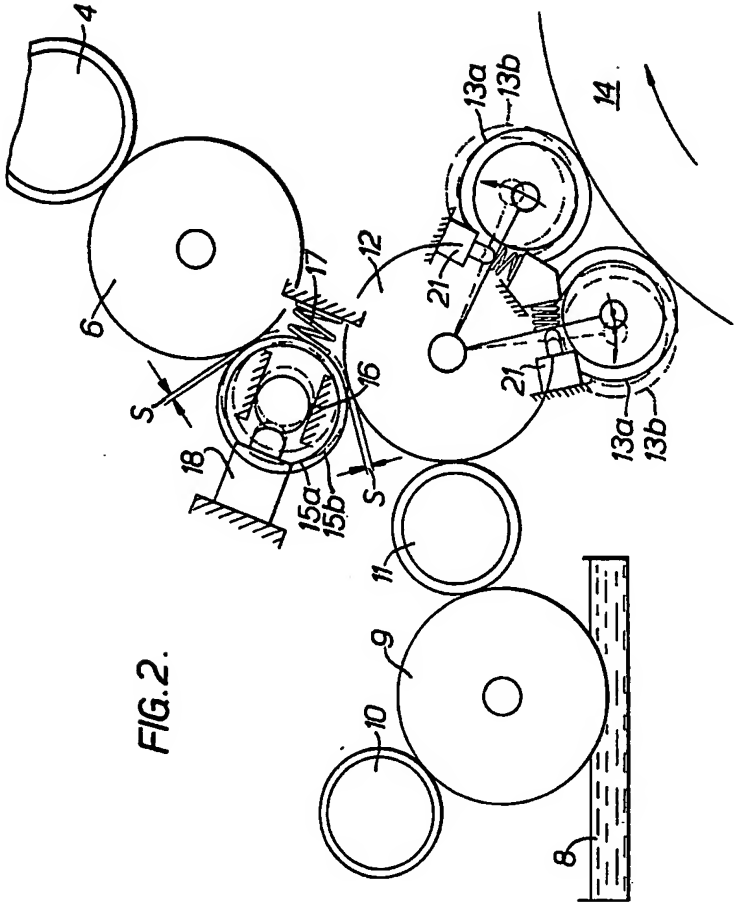

FIG.2.

1451693 COMPLETE SPECIFICATION
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Sheet 3

FIG. 3.